

IN THE CLAIMS:

For the Examiner's convenience, all pending claims are set forth below.

1. (Previously Presented) A speech synthesis apparatus having a database for managing phonemic piece data, comprising:

generating means for generating a first polyphone in consideration of a phonemic context for a phoneme as a search target;

search means for searching said database for a phonemic piece data corresponding to the first polyphone;

re-search means for generating a second polyphone by changing the phonemic context on the basis of the search result obtained by said search means, and re-searching said database for phonemic piece data corresponding to the second polyphone and

registration means for registering the search result obtained by said search means or said re-search means in a table in correspondence with the first or second polyphone.

2. (Previously Presented) The apparatus according to claim 1, wherein said registration means comprises

calculation means for calculating an average fundamental frequency of phonemic piece data searched out by said search means or said re-search means, and

sorting means for sorting the searched phonemic piece data group on the basis of the average fundamental frequency calculated by said calculation means, and

registers the phonemic piece data group and the first or second polyphone in correspondence with each other according to an order in which the phonemic piece data group is sorted by said sorting means.

3. (Previously Presented) The apparatus according to claim 1, wherein the first polyphone is a triphone obtained in consideration of phonemic contexts of right and left phonemes of the phoneme.

4. (Previously Presented) The apparatus according to claim 1, wherein the second polyphone is a phoneme obtained in consideration of at least one of phonemic contexts of right and left phonemes of the phoneme.

5. (Previously Presented) The apparatus according to claim 1, wherein the second polyphone is a phoneme obtained in consideration of a left phonemic context of the phoneme when the phoneme is a vowel, and a right phonemic context of the phoneme when the phoneme is a consonant.

6. (Original) The apparatus according to claim 2, wherein said registration means further comprises quantization means for quantizing an average fundamental frequency of the searched phonemic piece data.

7. (Original) The apparatus according to claim 6, wherein said calculation means interpolates a frequency, of average fundamental frequencies of phonemic piece data groups quantized by said quantization means, for which no corresponding phonemic data is present by using an average fundamental frequency which is adjacent to the frequency and for which corresponding phonemic piece data is present.

8. (Previously Presented) A speech synthesis apparatus for performing speech synthesis by using phonemic piece data managed by a database, comprising:

storage means for storing a table for managing position information indicating a position of phonemic piece data in the database in correspondence with a phoneme obtained in consideration of a phonemic context made to correspond to the phonemic piece data;

calculation means for acquiring phonemic context information of the phoneme as a synthesis target and fundamental frequencies corresponding thereto and calculating an average of the acquired fundamental frequencies;

search means for searching a phoneme group corresponding to the phonemic context information from the table;

acquisition means for acquiring, from the table, position information of the phonemic piece data corresponding to a predetermined phoneme of the phoneme group searched by said search means, on the basis of the average of fundamental frequencies calculated by said calculation means; and

changing means for acquiring the phonemic piece data indicated by the position information, acquired by said acquisition means from the database, and changing a prosody of the acquired phonemic piece data.

9. (Original) The apparatus according to claim 8, wherein said changing means changes the prosody by using a pitch synchronous waveform overlap adding method.

10. (Original) The apparatus according to claim 8, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said storage means manages the quantized fundamental frequency in the table in correspondence with position information indicating a position in the database at which phonemic piece data corresponding to the phoneme is present.

11. (Original) The apparatus according to claim 8, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said calculation means acquires phonemic context information of a phoneme as a synthesis target, and calculates an average of quantized fundamental frequencies of the phoneme group.

12. (Previously Presented) A control method for a speech synthesis apparatus having a database for managing phonemic piece data, comprising:

a generating step of generating a first polyphone in consideration of a phonemic context for a phoneme as a search target;

a search step of searching said database for a phonemic piece data corresponding to the first polyphone;

a re-search step of generating a second polyphone by changing the phonemic context on the basis of the search result obtained in said search step, and re-searching said database for phonemic piece data corresponding to the second polyphone; and

a registration step of registering the search result obtained in said search step or said re-search step in a table in correspondence with the first or second polyphone.

13. (Previously Presented) The method according to claim 12, wherein said registration step comprises

a calculation step of calculating an average fundamental frequency of phonemic piece data searched out in said search step or said re-search step; and

a sorting step of sorting the searched phonemic piece data group on the basis of the average fundamental frequency calculated in said calculation step, and

registering the phonemic piece data group and the first or second polyphone in correspondence with each other according to an order in which the phonemic piece data group is sorted in said sorting step.

14. (Previously Presented) The method according to claim 12, wherein the first polyphone is a triphone obtained in consideration of phonemic contexts of right and left phonemes of the phoneme.

15. (Previously Presented) The method according to claim 12, wherein the second polyphone is a phoneme obtained in consideration of at least one of phonemic contexts of right and left phonemes of the phoneme.

16. (Previously Presented) The method according to claim 12, wherein the second polyphone is a phoneme obtained in consideration of a left phonemic context of the phoneme when the phoneme is a vowel, and a right phonemic context of the phoneme when the phoneme is a consonant.

17. (Original) The method according to claim 13, wherein said registration step further comprises a quantization step of quantizing an average fundamental frequency of the searched phonemic piece data.

18. (Original) The method according to claim 17, wherein said calculation step comprises interpolating a frequency, of average fundamental frequencies of phonemic piece data groups quantized in said quantization step, for which no corresponding phonemic data is present by using an average fundamental frequency which is adjacent to the frequency and for which corresponding phonemic piece data is present.

19. (Previously Presented) A control method for a speech synthesis apparatus for performing speech synthesis by using phonemic piece data managed by a database, comprising:

a storage step of storing a table for managing position information indicating a position of phonemic piece data in the database in correspondence with a phoneme obtained in consideration of a phonemic context made to correspond to the phonemic piece data;

a calculation step of acquiring phonemic context information of the phoneme as a synthesis target and fundamental frequencies corresponding thereto and calculating an average of the acquired fundamental frequencies;

a search step of searching a phoneme group corresponding to the phonemic context information from the table;

an acquisition step of acquiring, from the table, position information of the phonemic piece data corresponding to a predetermined phoneme of the phoneme group searched in the search step, on the basis of the average fundamental frequencies calculated in said calculation step; and

a changing step of acquiring the phonemic piece data indicated by the position information acquired in said acquisition step from the database, and changing a prosody of the acquired phonemic piece data.

20. (Original) The method according to claim 19, wherein said changing step comprises changing the prosody by using a pitch synchronous waveform overlap adding method.

21. (Original) The method according to claim 19, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said storage step comprises managing the quantized fundamental frequency in the table in

correspondence with position information indicating a position in the database at which phonemic piece data corresponding to the phoneme is present.

22. (Original) The method according to claim 19, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said calculation step comprises acquiring phonemic context information of a phoneme as a synthesis target, and calculating an average of quantized fundamental frequencies of the phoneme.

23. (Previously Presented) A computer-readable memory storing program codes for controlling a speech synthesis apparatus having a database for managing phonemic piece data, comprising:

a program code for a generating step of generating a first polyphone in consideration of a phonemic context for a phoneme as a search target;

a program code for a search step of searching said database for a phonemic piece data corresponding to the first polyphone;

a program code for a re-search step of generating a second polyphone by changing the phonemic context on the basis of the search result obtained in the search step, and re-searching said database for phonemic piece data corresponding to the second polyphone; and

a program code for a registration step of registering the search result obtained in the search step or the re-search step in a table in correspondence with the first or second polyphone.



24. (Previously Presented) A computer-readable memory storing program codes for controlling a speech synthesis apparatus for performing speech synthesis by using phonemic piece data managed by a database, comprising:

a program code for a storage step of storing a table for managing position information indicating a position of phonemic piece data in the database in correspondence with a phoneme obtained in consideration of a phonemic context made to correspond to the phonemic piece data;

a program code for a calculation step of acquiring phonemic context information of the phoneme as a synthesis target and fundamental frequencies corresponding thereto and calculating an average of the acquired fundamental frequencies;

a program code for a search step of searching a phoneme group corresponding to the phonemic context information from the table;

a program code for an acquisition step of acquiring, from the table, position information of the phonemic piece data corresponding to a predetermined phoneme of the phoneme group searched in the search step, on the basis of the average of fundamental frequencies calculated in the calculation step; and

a program code for a changing step of acquiring the phonemic piece data indicated by the position information acquired in the acquisition step from the database, and changing a prosody of the acquired phonemic piece data.

25. (Previously Presented) A speech synthesis apparatus having a database for managing phonemic piece data, comprising:

generating means for generating a polyphone in consideration of a phonemic context for a phoneme as a search target;

search means for searching said database for a phonemic piece data corresponding to the polyphone;

re-search means for re-searching said database for phonemic piece data corresponding to the phoneme; and

registration means for registering the search result obtained by said search means or said re-search means in a table in correspondence with the polyphone.

26. (Previously Presented) A control method for a speech synthesis apparatus having a database for managing phonemic piece data, comprising:

a generating step of generating a polyphone in consideration of a phonemic context for a phoneme as a search target;

a search step of searching said database for a phonemic piece data corresponding to the polyphone;

a re-search step of re-searching said database for phonemic piece data corresponding to the phoneme; and

a registration step of registering the search result obtained by said search step or said re-search step in a table in correspondence with the polyphone.

27. (Previously Presented) A computer-readable memory storing program codes for controlling a speech synthesis apparatus having a database for managing phonemic piece data, comprising:

a program code for a generating step of generating a polyphone in consideration of a phonemic context for a phoneme as a search target;

a program code for a search step of searching said database for a phonemic piece data corresponding to the polyphone;

a program code for a re-search step of re-searching said database for phonemic piece data corresponding to the phoneme; and

a program code for a registration step of registering the search result obtained by said search step or said re-search step in a table in correspondence with the polyphone.